

AMENDMENTS TO THE CLAIMS

1. (currently amended) A high-speed optical recording apparatus in an optical storage device for generating a write signal according to an RLL modulation waveform inputted to the high-speed optical recording apparatus; so as to control a writing power of a pickup in the optical storage device, the recording apparatus comprising:

a clock generator for generating a first clock signal;

an adjustment data storage unit for storing a plurality of sets of write strategy

parameters, and selecting and outputting a corresponding set of write strategy parameters from plurality of the sets of write strategy parameters according to the RLL modulation waveform;

a rough delay unit electrically connected to the clock generator to receive the first clock signal, and further electrically connected to the adjustment data storage unit to receive the selected set of write strategy parameters, the rough delay unit for generating a fine delay parameter according to the selected set of write strategy parameters, and for delaying the RLL modulation waveform according to the first clock signal and the selected set of write strategy parameters to generate a first delay signal; and

a fine delay chain electrically connected to the rough delay unit to receive the first delay signal and the fine delay parameter, the fine delay chain for delaying the first delay signal according to the fine delay parameter so as to generate the write signal, the fine delay chain having a plurality of serially connected delay cells, each delay cell delaying the first delay signal by a predetermined period;

wherein the RLL modulation waveform is an NRZI modulation waveform, the apparatus generating the write signal according to an encoded modulation bits; ~~and~~

the clock generator further generates a second clock signal, the recording apparatus further comprising:

a delay adjustment state machine electrically connected to the clock

generator to receive the second clock signal, and further electrically connected to the adjustment data storage unit to receive the selected set of write strategy parameters, the delay adjustment state machine for generating a rough delay parameter and the fine delay parameter according to the selected set of write strategy parameters, and for delaying the NRZI modulation waveform according to the second clock signal and the set of write strategy parameters so as to generate a second delay signal; and

a rough delay counter or a rough delay shift register electrically connected to the clock generator to receive the first clock signal, and further electrically connected to the delay adjustment state machine to receive the second delay signal in order to delay the second delay signal according to the first clock signal, and to receive the rough delay parameter so as to generate the first delay signal; and

the delay cells are a plurality of serially connected inverters or buffers, the fine delay chain further comprising a multiplexer for selecting the write signal from a plurality of outputs of the inverters or buffers.

2. (cancelled)

3. (cancelled)

4. (previously presented) The high-speed optical recording apparatus of claim 1 wherein clock generator comprises a phase locked loop for generating the first clock signal, and a frequency divider for dividing a frequency of the inputted first clock signal to generate the second clock signal.

5. (previously presented) The high-speed optical recording apparatus of claim 1 wherein a period of the second clock signal is equal to a base period of the RLL modulation waveform.

6. (previously presented) The high-speed optical recording apparatus of claim 1

wherein a period of the second clock signal is equal to a multiple of a period of the first clock signal.

- 5 7. (previously presented) The high-speed optical recording apparatus of claim 1 wherein a resolution of the delay adjustment state machine delaying the RLL modulation waveform is equal to a period of the second clock signal.
- 10 8. (previously presented) The high-speed optical recording apparatus of claim 1 wherein the rough delay counter comprises a counter, and a comparator.
9. (previously presented) The high-speed optical recording apparatus of claim 1 wherein a resolution of the rough delay counter delaying the second delay signal is equal to a period of the first clock signal.
- 15 10. (previously presented) The high-speed optical recording apparatus of claim 1 further comprising an NRZI input interface for receiving the NRZI modulation waveform and generating an address signal.
- 20 11. (original) The high-speed optical recording apparatus of claim 10 wherein the EFM input interface generates the address signal according to a previous land section, a current pit section, and a next land section in the EFM modulation waveform.
- 25 12. (original) The high-speed optical recording apparatus of claim 10 wherein the rough delay unit is electrically connected to the NRZI input interface to receive the NRZI modulation waveform.
- 30 13. (original) The high-speed optical recording apparatus of claim 10 wherein the adjustment data storage unit is electrically connected to the EFM input interface to receive the address signal for selecting the corresponding write strategy parameter according to the address signal.

14. (previously presented) The high-speed optical recording apparatus of claim 1 further comprising a data storage setting interface electrically connected to the adjustment data storage unit, and further electrically connected to a microprocessor of the optical storage device to receive the sets of write strategy parameters and storing the sets of write strategy parameters into the adjustment data storage unit.
15. (previously presented) The high-speed optical recording apparatus of claim 1 wherein the adjustment data storage unit is a volatile memory.
16. (cancelled)
17. (previously presented) The high-speed optical recording apparatus of claim 1 wherein a resolution of the fine delay chain delaying the first delay signal is equal to the predetermined period.
18. (previously presented) The high-speed optical recording apparatus of claim 1 wherein the EFM modulation waveform is generated by an EFM encoder of the optical storage device.
19. (new) A high-speed optical recording apparatus in an optical storage device for generating a write signal according to an RLL modulation waveform inputted to the high-speed optical recording apparatus, so as to control a writing power of a pickup in the optical storage device, the recording apparatus comprising:
- a clock generator for generating a first clock signal;
 - an adjustment data storage unit for storing a plurality of sets of write strategy parameters, and selecting and outputting a corresponding set of write strategy parameters from the plurality of sets of write strategy parameters according to the RLL modulation waveform;
 - a rough delay unit electrically connected to the clock generator to receive the first clock signal, and further electrically connected to the adjustment data storage unit to receive the selected set of write strategy parameters, the

- rough delay unit for generating a fine delay parameter according to the selected set of write strategy parameters, and for delaying the RLL modulation waveform according to the first clock signal and the selected set of write strategy parameters to generate a first delay signal;
- 5 a fine delay chain electrically connected to the rough delay unit to receive the first delay signal and the fine delay parameter, the fine delay chain for delaying the first delay signal according to the fine delay parameter so as to generate the write signal;
- the fine delay chain comprising a plurality of serially connected delay cells, an
- 10 output of each delay cell thereby delaying the first delay signal by a predetermined period corresponding to a number of previous delay cells in the fine delay chain; and
- the fine delay chain further comprising a multiplexer having inputs coupled to the outputs of the delay cells, a selecting end coupled to the fine delay
- 15 parameter, and an output end being coupled to the write signal, the multiplexer for generating the write signal being one of the outputs of the delay cells as selected according to the fine delay parameter.
20. (new) The high-speed optical recording apparatus of claim 19 wherein the RLL
- 20 modulation waveform is an NRZI modulation waveform, the apparatus generating the write signal according to an encoded modulation bits.
21. (new) The high-speed optical recording apparatus of claim 20 wherein the clock
- 25 generator further generates a second clock signal, the recording apparatus further comprising:
- a delay adjustment state machine electrically connected to the clock generator to receive the second clock signal, and further electrically connected to the adjustment data storage unit to receive the selected set of write strategy parameters, the delay adjustment state machine for generating a rough
- 30 delay parameter and the fine delay parameter according to the selected set of write strategy parameters, and for delaying the NRZI modulation waveform according to the second clock signal and the set of write strategy

parameters so as to generate a second delay signal; and
a rough delay counter or a rough delay shift register electrically connected to the
clock generator to receive the first clock signal, and further electrically
connected to the delay adjustment state machine to receive the rough delay
parameter and the second delay signal for delaying the second delay signal
5 according to the first clock signal and the rough delay parameter so as to
generate the first delay signal.

22. (new) The high-speed optical recording apparatus of claim 21 wherein clock
10 generator comprises a phase locked loop for generating the first clock signal, and
a frequency divider for dividing a frequency of the inputted first clock signal to
generate the second clock signal.

23. (new) The high-speed optical recording apparatus of claim 21 wherein a period of
15 the second clock signal is equal to a base period of the RLL modulation
waveform.

24. (new) The high-speed optical recording apparatus of claim 21 wherein a period of
the second clock signal is equal to a multiple of a period of the first clock signal.
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25. (new) The high-speed optical recording apparatus of claim 21 wherein a resolution
of the delay adjustment state machine delaying the RLL modulation waveform is
equal to a period of the second clock signal.

25 26. (new) The high-speed optical recording apparatus of claim 21 wherein the rough
delay counter comprises a counter, and a comparator.

27. (new) The high-speed optical recording apparatus of claim 21 wherein a resolution
of the rough delay counter delaying the second delay signal is equal to a period
30 of the first clock signal.

28. (new) The high-speed optical recording apparatus of claim 20 further comprising

an NRZI input interface for receiving the NRZI modulation waveform and generating an address signal.

- 5 29. (new) The high-speed optical recording apparatus of claim 28 wherein the EFM input interface generates the address signal according to a previous land section, a current pit section, and a next land section in the EFM modulation waveform.
- 10 30. (new) The high-speed optical recording apparatus of claim 28 wherein the rough delay unit is electrically connected to the NRZI input interface to receive the NRZI modulation waveform.
- 15 31. (new) The high-speed optical recording apparatus of claim 28 wherein the adjustment data storage unit is electrically connected to the EFM input interface to receive the address signal for selecting the corresponding write strategy parameter according to the address signal.
- 20 32. (new) The high-speed optical recording apparatus of claim 20 further comprising a data storage setting interface electrically connected to the adjustment data storage unit, and further electrically connected to a microprocessor of the optical storage device to receive the sets of write strategy parameters and storing the sets of write strategy parameters into the adjustment data storage unit.
- 25 33. (new) The high-speed optical recording apparatus of claim 20 wherein the adjustment data storage unit is a volatile memory.
- 30 34. (new) The high-speed optical recording apparatus of claim 20 wherein a resolution of the fine delay chain delaying the first delay signal is equal to the predetermined period.
35. (new) The high-speed optical recording apparatus of claim 20 wherein the EFM modulation waveform is generated by an EFM encoder of the optical storage device.

36. (new) The high-speed optical recording apparatus of claim 19, wherein the fine delay chain is for delaying the first delay signal only according to the fine delay parameter so as to generate the write signal.

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37. (new) The high-speed optical recording apparatus of claim 19, wherein the fine delay chain is not connected to and does not utilize a clock signal for delaying the first delay signal to generate the write signal.

10 38. (new) The high-speed optical recording apparatus of claim 19, wherein the delay cells within the fine delay chain are buffers.

39. (new) The high-speed optical recording apparatus of claim 19, wherein the delay cells within the fine delay chain are inverters.

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40. (new) A high-speed optical recording apparatus in an optical storage device for generating a write signal according to an RLL modulation waveform inputted to the high-speed optical recording apparatus, so as to control a writing power of a pickup in the optical storage device, the recording apparatus comprising:

20 a clock generator for generating a first clock signal;
an adjustment data storage unit for storing a plurality of sets of write strategy parameters, and selecting and outputting a corresponding set of write strategy parameters from the plurality of sets of write strategy parameters according to the RLL modulation waveform;

25 a rough delay unit electrically connected to the clock generator to receive the first clock signal, and further electrically connected to the adjustment data storage unit to receive the selected set of write strategy parameters, the rough delay unit for generating a fine delay parameter according to the selected set of write strategy parameters, and for delaying the RLL

30 modulation waveform according to the first clock signal and the selected set of write strategy parameters to generate a first delay signal;
a fine delay chain electrically connected to the rough delay unit to receive the

first delay signal and the fine delay parameter, the fine delay chain for
delaying the first delay signal according to the fine delay parameter so as
to generate the write signal; and

the fine delay chain comprising a plurality of serially connected delay cells, an
5 output of each delay cell thereby delaying the first delay signal by a
predetermined period corresponding to a number of previous delay cells in
the fine delay chain;

wherein the fine delay chain is not connected to and does not utilize a clock
10 signal for delaying the first delay signal to generate the write signal.